

Ikhlef et al.

S/N: 10/707,407

REMARKS

Claims 1-9, 12-15, and 18-25 are pending in the present application. In the Office Action mailed July 27, 2005, the Examiner rejected claim 1, 4-10, 12-14, and 20-25 under 35 U.S.C. §103(a) as being anticipated over Mattson et al. (USP 6,553,092) in view of Fujii et al. (USP 4,982,096). The Examiner next rejected claims 2 and 3 under 35 U.S.C. §103(a) as being unpatentable over Mattson et al. and Fujii et al. as applied to claim 1 above, and further in view of Hoheisel et al. (USP 6,847,701). Claim 11 is rejected under 35 U.S.C. §103(a) as being unpatentable over Mattson et al. and Fujii et al. as applied to claim 10 above, and further in view of Iwanczyk et al. (USP 6,534,773). Claims 15-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mattson et al. in view of Fujii et al. and Iwanczyk et al.

Claims 1, 8, 9, 12, 15, and 20 have been amended to further define the present invention over the art of record. In light of the amendment to claim 8, claims 10 and 11 have been canceled and in light of the amendment to claim 15, claims 16 and 17 have been canceled.

Claim 1, as originally presented, was rejected as being obvious in light of Mattson et al. and Fujii et al. Accordingly, Applicant has amended claim 1 to clarify that the scintillator array and the photodiode array are each arranged along a respective plane that are parallel to one another and orthogonal to a direction of x-ray incidence on the scintillator array. The optical mask has been further defined to be arranged along a plane that is parallel to the planes of the scintillator and photodiode arrays, but also disposed between the scintillator and photodiode arrays. This amendment further defines the invention called for in claim 1 over the art of record.

Specifically, both Mattson et al. and Fujii et al. teach a radiographic detector having scintillation elements and photodiode elements. Both references teach that the scintillation elements and the photodiode elements are arranged in layers parallel to one another. However, neither reference teaches an optical mask layer sandwiched between the scintillator and photodiode layers as presently called for in claim 1. Mattson et al. teaches "anti-scatter grid elements" that are arranged vertically, i.e., parallel to the path of x-ray incidence, between adjacent scintillators, as best shown in Figs. 6, 6A, and 6B of '092.

Similarly, Fujii et al. teaches "separators" that are "located on both sides" of a given scintillator. Fujii et al., col. 3, ll. 11-13. These "separators" are effectively collimators or reflectors that are positioned between adjacent scintillators, as best shown in Figs. 4-5. The separators, which are referenced as numeral 104 and 104A, each extend vertically between adjacent scintillators and, in the embodiment of Fig. 5, extend upwardly past the x-ray reception surface of the scintillators 102 toward the source of x-rays 101. As shown in both figures, the

Ikhlef et al.

S/N: 10/707,407

separators are arranged parallel to the path of x-rays and, as such, are not arranged in a plane that is parallel to the planes of the scintillators and the photodiodes, as presently claimed. Accordingly, claim 1 calls for subject matter neither taught nor suggested by Mattson et al. or Fujii et al. Claims 2-7 are also believed allowable based on their dependency from an otherwise allowable claim.

Claim 8, as originally presented, was also rejected based on the combination of Mattson et al. and Fujii et al. Claim 8 has been amended to, first, improve its readability, and, second, to further define the claimed invention over the art of record. With respect to the latter, claim 8 has been amended to define the at least one mask element as being formed of optically absorbing material and disposed in a plane between the first and the second scintillators and the first and the second photodiodes. Additionally, claim 8 has been amended to define the at least one mask element as having a width that exceeds the width separating the first and the second scintillators from one another. It is believed that this amendment further defines the claimed invention over the art of record.

In addition to amending the claim to call for the at least one masking element to be formed of optically absorbing material, subject matter similar to that originally presented in claim 11 has been added to claim 8. Claim 11, which has now been canceled, was originally rejected based on Mattson et al., Fujii et al., and Iwanczyk et al. The Examiner acknowledged that neither Mattson et al. nor Fujii et al. disclosed "a width of each mask element [that] exceeds that of a width of a lateral gap" that extends between adjacent scintillators. Accordingly, the Examiner relied upon Iwanczyk et al. for such a teaching. Specifically, the Examiner relied upon the reference's disclosure of a metallic grid that operates as a mask "wherein a width of each mask element (fig. 5, #26) exceeds that of a width of a lateral gap (fig. 5, gap defined by #22 and between #30)." Office Action, July 27, 2005, p. 6.

Iwanczyk et al. discloses a "metallic grid 26, which in one embodiment is aluminum, thus plays a dual role as an aid to proper alignment of the photodiode array 16 with the scintillator array 12, and as a way to lower the series resistance of the photodiode entrance electrode 14." Iwanczyk et al., col. 3, ll. 37-42. Iwanczyk et al. never discloses that the metallic grid is formed of optically absorbent material, as presently claimed, and suggests an optically reflective material. Specifically, as set forth above, Iwanczyk et al. discloses that the metallic grid is formed of aluminum. While the reference indicates that other non-aluminum materials are contemplated, at a minimum, the grid is disclosed as being "metallic". One skilled in the art would readily recognized that aluminum and other metals are not optically absorbent, but are, in fact, light

Ikhlef et al.

S/N: 10/707,407

reflective. The reference discloses such a feature and indicates that this light reflective advantageously assists in achieving "precise and reliable alignment of the photodiode array 16 with the scintillator array 12." Id., col. 4, ll. 59-61. Specifically, "[t]he metallic grid 26 at the surface of the photodiode is thus easily visible through the transparent scintillator segments 18 due to light reflections and the strong contrast between light reflected from the grid pattern 26 versus the rest of the highly light absorbing photodiode entrance window 14." Id., col. 4, ll. 53-58 (emphasis added). Therefore, the combination of references relied upon by the Examiner fail to teach an optically absorbent mask disposed in a plane between a first and a second scintillator and a first and second photodiode, wherein the mask has at least one mask element having a width that exceeds the width separating the first and the second scintillators, as claimed. Accordingly, claim 8 as well as claims 9 and 12-14 depending therefrom are believed to be in condition for allowance.

Claim 20 was also rejected as being unpatentable over Mattson et al. and Fujii et al. Claim 20 has been amended to further define that "the optical cross-talk mask is sandwiched between the cellular arrangement of scintillators and the cellular arrangement of photodiodes," and that the cellular arrangement of scintillators, the cellular arrangement of photodiodes, and the optical cross-talk mask are arranged in a multi-layer stack. By this amendment, Applicant has clarified that the optical cross-talk mask is sandwiched between a layer of photodiodes and a layer of scintillators. The art of record fails to teach or suggest such a configuration. The art of record, at best, discloses collimator plates or elements between adjacent pairs of scintillators along a path that is parallel to x-ray incidence on the scintillators. Claim 20 calls for the scintillators, photodiodes, and optical mask to be arranged orthogonal to a central axis of x-ray incidence on the photodiodes. Thus, it is believed that claim 20 is directed to patentably distinct subject matter. Allowance of claims 20-25 is therefore requested.

Claims 2 and 3 stand rejected as being unpatentable over Mattson et al. and Fujii et al. and in further view of Hoheisel et al. While Applicant disagrees with the Examiner with respect to the art as applied, Applicant does not believe additional remarks are necessary as claims 2 and 3 depend from what is believed an otherwise allowable claim and, as such, requests allowance of claims 2 and 3 based on the chain of dependency.

Claim 11 has been canceled. The rejection thereof is believed to be moot.

Claims 15-19 stand rejected as being unpatentable over Mattson et al. in view of Fujii et al. and in further view of Iwanczyk et al. Claim 15 has been amended to further define the optical cross-talk inhibitors as being fabricated from optically absorbent material. As previously

Ikhlef et al.

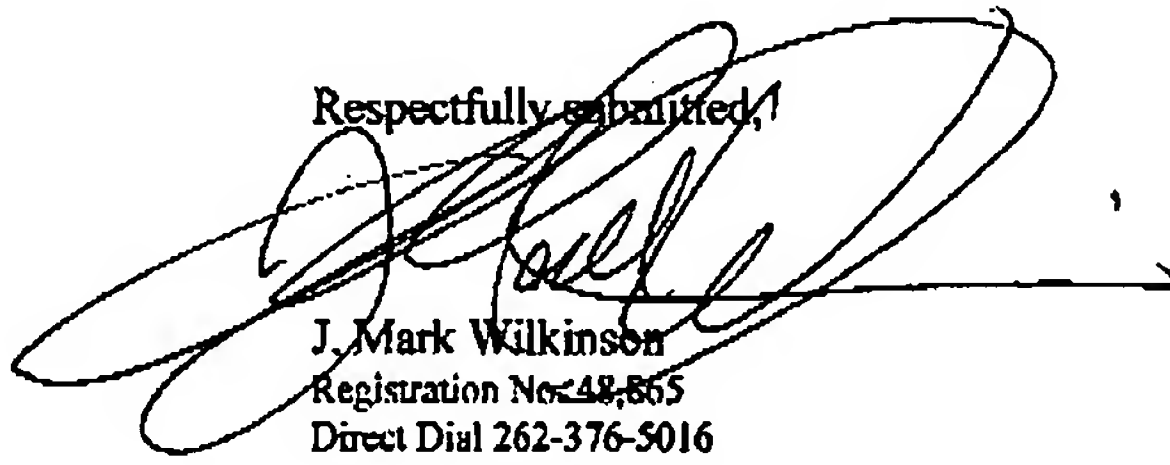
S/N: 10/707,407

established, Iwanczyk et al. discloses a metallic grid that the Examiner has equated to the claimed optical cross-talk inhibitors. Iwanczyk et al. discloses that grid is not only "metallic", such as "aluminum", but is light reflective and this light reflective feature is purposeful as it assists with the "precise and reliable alignment of the photodiode array 16 with the scintillator array." Iwanczyk et al., col. 4, ll. 59-61. Therefore, the combination of references relied upon by the Examiner fails to teach or suggests that which is called for in claim 15. Allowance of claims 15-19 is therefore requested.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-9, 12-15, and 18-25.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,



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Dated: August 26, 2005
Attorney Docket No.: GEMS8081.201

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